

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-11 are pending in the present application. Claims 1, 3, 5, and 6 have been amended without adding new matter and Claims 2 and 12-14 have been canceled without prejudice.

In the outstanding Office Action, the specification and the abstract were objected to; Claims 1-4 and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Veneklasen et al. (U.S. Patent No. 6,392,333 B1, herein "Veneklasen") in view of Takigawa et al. (U.S. Patent No. 4,430,570, herein "Takigawa"); Claims 5-8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Veneklasen, Takigawa, and Ishii et al. (U.S. Patent No. 4,482,838, herein "Ishii"); and Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Veneklasen, Takigawa and Hiraoka et al. (U.S. Patent No. 4,311,941, herein "Hiraoka").

Applicants thank the Examiner for the courtesy of an interview extended to Applicants' representative on January 22, 2004. During the interview differences between the claims and the applied art were discussed. Further, claim amendments clarifying the claims over the applied art were discussed. The present amendment sets forth those discussed claim amendments. The Examiner indicated that the claim amendments appear to distinguish over the applied art and she would further review the amended claims in view of a filed response. Arguments presented during the interview are reiterated below.

Claim 6 has been amended to recite a specific range for a diameter of a flat electron emission surface as disclosed in the specification at page 7, line 19, to page 8, line 6, and the "apex angle" feature has been omitted.

As discussed during the interview, new Figures 4 and 5 are added to show spherical and flat electron emission surfaces of an electron cathode and the specification is amended to conform with the new figures. No new matter is believed to be added as the spherical and flat surfaces are disclosed in the specification for example at page 7, lines 1-12.

Regarding the objection to the specification and the abstract, both the specification and the abstract are amended as suggested in the outstanding Office Action without adding new matter. Accordingly, it is respectfully requested that this objection be withdrawn.

Claims 1-4 and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Veneklasen and Takigawa. That rejection is respectfully traversed.

Independent Claim 1 is amended to recite that an electron emission surface of an electron emission cathode is spherical. The claim amendment finds support in originally filed Claim 2.

Briefly recapitulating, Claim 1 is directed to an electron gun including an electron emission cathode, a control electrode, and an extractor. The electron emission cathode is made of rare earth hexaboride and a tip of the electron emission cathode is located between the control electrode and the extractor. In addition, the electron emission surface of the electron emission cathode is spherical. Claim 5 is amended to recite similar features as Claim 1 except that the electron emission surface of the electron emission cathode is flat.

In a non-limiting example, Figure 1 shows the electron emission cathode 1, the control electrode 6, and the extractor 7. In another non-limiting example, Figures 4 and 5 show the spherical and flat electron emission surfaces, respectively.

The electron gun of Claim 1 advantageously achieves “a higher angular intensity” at an initial stage of operation and the electron gun of Claim 5 advantageously achieves “a stable angular intensity” at a later stage of operation.¹

Turning to the applied art, Veneklasen shows in Figure 2 an electron emission cathode 14, a control element 16, and an extractor 24 such that a tip of the electron emission cathode is located between the control electrode and the extractor. As recognized in the outstanding Office Action at page 4, lines 8-9, Veneklasen does not teach or suggest that the electron emission cathode is made of rare earth hexaboride. In addition, as discussed during the interview, Veneklasen does not teach or suggest that an electron emission surface of the electron emission cathode is spherical as required in Claim 1.

The outstanding Office Action relies on Takigawa for teaching an electron emission cathode made from a rare earth hexaboride. However, as discussed during the interview, Takigawa also does not teach or suggest an electron emission surface of the electron emission cathode that is spherical.

Accordingly, it is respectfully submitted that independent Claims 1 and 5 and each of the claims depending therefrom patentably distinguish over the combination of Veneklasen and Takigawa.

Claims 5-8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Veneklasen, Takigawa and Ishii. That rejection is respectfully traversed.

The outstanding Office Action recognizes at page 5, lines 8-9, that “Veneklasen and Takigawa fail to teach or fairly suggest the electron emission cathode being flat.” The outstanding Office Action relies on Ishii for teaching an electron emission cathode being flat. However, as discussed during the interview, Ishii shows in Figures 1-7 an electron emission cathode having various surfaces but none of them is flat as required by Claim 5. Therefore,

¹ Specification, page 6, line 27, to page 7, line 12.

none of Veneklasen, Takigawa, Ishii, and any combination of these references teaches or suggests that an electron emission surface of an electron emission cathode is flat as required in independent Claim 5.

Accordingly, it is respectfully submitted that independent Claim 5 and each of the claims depending therefrom patentably distinguish over Veneklasen, Takigawa, Ishii, and any combination of these references.

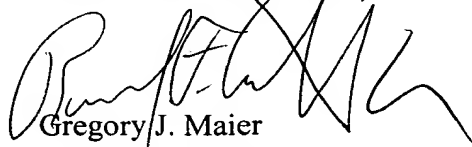
Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Veneklasen, Takigawa, and Hiraoka. That rejection is respectfully traversed.

The outstanding Office Action relies on Hiraoka for teaching an emission cathode made of pyrolytic carbon. However, Hiraoka does not overcome the deficiencies of Veneklasen and Takigawa discussed above. In addition, Claims 9 and 10 depend on independent Claim 5, which as discussed above is believed to be allowable. Accordingly, it is respectfully submitted that Claims 9 and 10 are also allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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